Factors affecting threshold chloride for reinforcement corrosion in concrete

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Abstract: Three cements with variable C3A contents were mixed with different levels of chloride, alkali and sulfate contents to study the effect of these parameters on pore solution composition. Effect of exposure temperature was also studied by curing the chloride-treated specimens at 20° and 70 °C. Pore solution was extracted using a high pressure pore solution extrusion device and analyzed for chloride and hydroxyl ion concentrations. Threshold chloride for onset of reinforcement corrosion was computed using threshold [Cl-/OH-] ratio of 0.3. The results showed that C3A content and exposure temperature have very strong influence on threshold chloride content. Alkali content of cement has marginal effect whereas presence of sulfates along with chlorides has moderate effect on the threshold chloride content.